

Notes on the tribe Petrognathini Blanchard, 1845 from China, with description of a new species from Yunnan (Coleoptera, Cerambycidae, Lamiinae)

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Abstract

Ithocritus ruber (Hope, 1839), the type species of the genus *Ithocritus* Lacordaire, 1872 is reinvestigated, and a partially sympatric species, *Ithocritus similis* Bi & Lin, **sp. nov.** (相似短柄天牛, Xiāng sì duǎn bǐng tiān niú), is described. The genus *Falsimalmus* Breuning, 1956 is newly recorded from China, based on the discovery of *Falsimalmus niger* Breuning, 1956 from Yunnan. New localities, illustrations of habitus, endophallic structure and major diagnostic features for all involved taxa are provided.

Key words: Taxonomy, Oriental Region, sympatry

Introduction

The tribe Petrognathini was reviewed by Breuning (1956), with 13 African and six Asian genera, most of the African genera were transferred to the tribes Pachystolini (= Neopachystolini) and Tetraulaxini (Breuning & Teocchi, 1985). Ohbayashi & Lin (2012) reviewed the Asian Petrognathini, with six genera and nine species from Asia (the genus *Elongatohomelix* Breuning, 1967 from Sumatra was not included). Lin & Yang (2014) reported three genera and four species from China.

In this study, the third species of *Ithocritus* Lacordaire, 1872 is described as new from Western Yunnan, China. The monotypic genus *Falsimalmus* Breuning, 1956 is newly recorded from China upon the discovery of *M. niger* Breuning, 1956 from western Yunnan, raising the Chinese fauna of this tribe to four genera and six species. Illustrations of habitus, endophallic structures and major diagnostic features for all involved taxa are provided. The tribal position is briefly discussed.

Materials and method

The studied materials belong to the following institutions, museums or private collections, of which abbreviations are shown in the text:

CBWX: Collection of Wen-Xuan Bi, Shanghai, China

CCCC: Collection of Chang-Chin Chen, Tianjin, China

IZCAS: Institute of Zoology, Chinese Academy of Sciences, Beijing, China

OUMNH: Oxford University Museum of Natural History, Oxford, UK

SNUC: Insect Collection of Shanghai Normal University, Shanghai, China

The abbreviations for terminology of endophallic structures follow Bi & Lin (2016): BPH-basal phallomere; MPH-median phallomere; APH-apical phallomere; MT-medial tube; CT-central trunk; PB-preapical bulb.

Taxonomy

Tribe Petrognathini Blanchard, 1845

Diagnosis (modified from Ohbayashi & Lin 2012). Antennal scape without cicatrix or granules at apex; mandible neither elongate nor longitudinally grooved; eyes emarginate; pronotum provided with lateral spines; mesocoxal cavity open to epimeron; metepisternum not distinctly widened; legs stout; mesotibiae with an external sinus; tarsal claws simple and divaricate.

Genus *Ithocritus* Lacordaire, 1872

Ithocritus Lacordaire, 1872: 448. Type species: *Monochamus ruber* Hope, 1839, by original designation.

Ithocritus; Gemminger, 1873: 3059; Aurivillius, 1922: 206; Breuning, 1956: 354; Löbl & Smetana, 2010: 291; Lin & Jiroux, 2011: 108; Ohbayashi & Lin, 2012: 237; Lin & Yang, 2019: 340.

Remarks. Including the types species, two of the three known species of the genus have been investigated in this study. Both species with granules near outer edge of scape (Fig. 11), which is inconsistent with the tribal definition proposed by Breuning (1956) and Ohbayashi & Lin (2012).

Male genitalia of the two studied species has the endophallus lacking the crescent-shaped sclerites (cs), which accordant with the structure observed in *Petrognatha* Leach, 1819 (type genus of the tribe), *Ioesse* Thomson, 1864, and *Pseudapriona* Breuning, 1936. The consistency of this character among these studied genera superficially stabilized their tribal treatment. However, the absence of such crescent-shaped sclerites in the male endophallus have been reported in several taxa from different tribes of subfamily Lamiinae, e.g. some species of *Phytoeciini* (as “basal-lateral-ventral sclerites”, Kasatkin 2006), *Mimocagosima* Breuning, 1968 and *Thermistis* Pascoe, 1867 of *Saperdini* (as “basal armature” – Lin, Li & Yang 2008; Lin *et al.* 2012), *Acanista* Pascoe, 1864 of *Acanthocinini*, *Pentacosmia* Newman, 1842 and *Probatodes* Thomson, 1864 of *Rhodopinini* (both genera currently in *Desmiphorini*), *Rosenbergia* Ritsema, 1881 of *Batocerini* (as “crescent-shaped sclerites”, Ślipiński & Escalona 2013), and have also been observed in *Pseudomeges* Breuning, 1943 and *Myagrus* Pascoe, 1878 of *Lamiini* (both genera currently in *Monochamini*) (Bi, unpublished). The species of *Apriona* Chevrolat, 1852 and *Batocera* Dejean, 1835 (*Batocerini*) from China lack the crescent-shaped sclerites, while *Batocera* spp. from Australia were reported by Ślipiński & Escalona (2013) having “large crescent-shaped sclerites”, and the species of *Microcriodes* Breuning, 1943, also *Batocerini*, have such sclerites. These variations undoubtedly indicate a more complicated situation, making questionable the tribal position of *Ithocritus*.

Ithocritus ruber (Hope, 1839)

(Figs. 1–3, 8, 9, 12, 13, 15, 19)

Monochamus ruber Hope, 1839: 43; Hope, 1840: 441, pl. 30, fig. 5.

Ithocritus ruber: Lacordaire, 1872: 448; Gemminger, 1873: 3059; Aurivillius, 1922: 206; Breuning, 1956: 354, fig. 1; Mukhopadhyay & Biswas, 2000: 59; Löbl & Smetana, 2010: 291; Lin & Jiroux, 2011: 108, figs. 13–18; Ohbayashi & Lin, 2012: 238, figs. 1–5; Lin & Yang, 2014: 309, figs. 1–11; Mitra *et al.*, 2016: 44; 2017: 86; Lin & Yang, 2019: 340.

Type material examined. Syntypes of *Monochamus ruber*, 2 males, India, Assam, leg. William Griffith (in OUMNH). Examined by photographs taken by James Hogan.

Other materials examined. China (Yunnan): 1 male, 1 female, Yunnan, Longchuan, Husa Xiang, 24.358315°N, 97.834079°E, alt. 1353m, 2013.VIII.10, leg. Zhi-Shun Song, Qiang-Feng Zheng (IZCAS); 1 male, Yunnan, Gongshan, Maku, 1200m, 2015.VI.26, leg. Xiao-Dong Yang (CCCC); 1 male, ditto except 1500m, 2015.VIII.7 (CCCC); 1 male, ditto except 1250m, 2015.VI.27, leg. Wen-Xuan Bi (CBWX); 1 female, ditto except 1500m, 2015.VII.18 (CBWX); 1 male, ditto except 1250m, 2015.VII.20 (CBWX); 1 male, ditto except 2015.VII.2 (CBWX); 1 female, ditto except 1500m, 2015.VIII.9 (CBWX); 1 female, ditto except 1500m, 2015.VII.21, leg. Chao Wu (CBWX). **China (Xizang):** 2 males, 1 female, Xizang, Motuo, Baricun, 1850m, 2014.VII.26, leg. Wen-Xuan Bi (CBWX);

1 male, ditto except 2014.VII.29 (CBWX); 1 female, Xizang, Linzhi City, Mêdog County, Dexingxiang, Yarang power station, 29.27022°N, 95.248532°E, alt. 706m, 2019.VIII.1, leg. Hao-Dong Yin (IZCAS).

Complementary description to Breuning (1956) and Lin & Jiroux (2011). Integument of body, antennae and legs blackish; elytra reddish ochraceous. Head, pronotum, elytra predominantly covered with bright pubescence which is individually variable from brick-red to pale orange or yellowish white (Figs. 1–3). Ventral surface predominantly covered with fine blackish pubescence, except for anteromedian of prosternum, most of mesanepisternum, posterior angle of metasternum and lateral sides of abdominal ventrite I to V covered with same variably colored pubescence as in dorsal surface. Scutellum moderately pubescent, not obscuring integument, giving it darkened appearance (Figs. 8, 9). Male genitalia with endophallus, in everted condition (Fig. 19), about 2.3 times as long as median lobe, curved near apical fourth dorsally; APH defined, BPH and MPH roughly defined by basal-lateral tubercle (blt); crescent-shaped sclerite absent; MPH subdivided into MT+CT and PB by constrictions, MT *ca.* 1.5 times longer than CT or PB; MT with ventral swelling (vs) generally rudimentary; CT with lateral tubercles (ltc, Fig. 19d) weakly developed; PB weakly swollen laterally and ventrally near base, thence, in ventral view, strongly constricted toward subparallel-sided apex (Fig. 19d); APH not subdivided, in lateral view, moderately swollen, slightly protruding ventrally; apical furrow (af) with internal membrane (im) incomplete, represented by short dorsal appendix; spicules mainly distributed on ventral apical surface of MT and apical half of PB; ejaculatory ducts (ej) paired, gonopore (gn) situated near apex of dorsal side of APH. Female with ventrite V (Fig. 15) narrowly protruded, apex 0.13 times basal width.

Distribution. China: Yunnan, Xizang (new province record); India: Assam (Mukhopadhyay & Halder 2003), Meghalaya, Sikkim and West Bengal; Bangladesh (Silhet = Sylhet); Myanmar (Kachin, Mandale), Nepal.

***Ithocritus similis* Bi & Lin, sp. nov.**

(Figs. 4, 5, 10, 11, 14, 16, 17, 20)

Type material. Holotype: male, “CHINA. Yunnan, Gongshan / Dulongjiang, Maku / 1500m, 2015.VIII.7 / leg. Xiao-Dong Yang” (SNUC). **Paratypes:** 1 female, same locality as holotype “2015.VII.21 / leg. Chao Wu” (CCCC); 1 female, ditto “2015.VIII.9 / leg. Wen-Xuan Bi” (CBWX); 1 male, “CHINA. Yunnan, Gongshan / Dulongjiangxiang / 1480m, 2017.VII.30 / local collector” (CCCC).

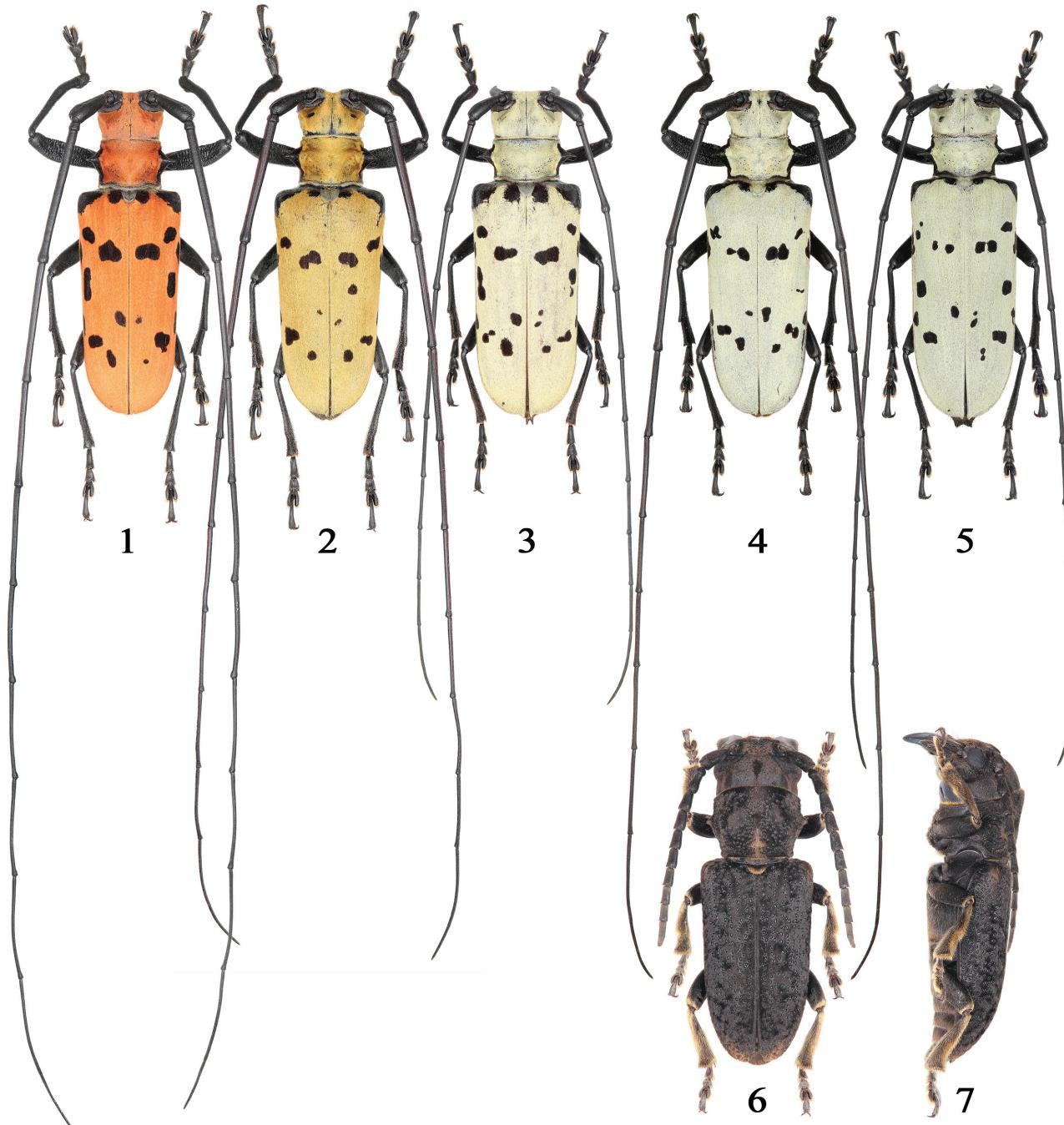
Description. Male (Fig. 4). Body length 30.0–32.5 mm, humeral width 10.0–10.1 mm. Integument of body, antennae and legs blackish; elytra dark-brown. Head except for anterior margin of frons, genae and antennal insertions, pronotum except for sides and posterolateral margins, scutellum and most of elytra densely covered with yellowish-white pubescence. Elytron with blackish pubescent macula involving humerus, blackish pubescent macula near scutellum, and a few small irregular blackish spots near basal and apical third. Ventral surface predominantly covered with fine blackish pubescence, except for anteromedian area of prosternum, most of mesanepisternum, posterior angle of metasternum, postmedian area of metanepisternum, sides of abdominal ventrite I to V, and antero-lateral area of metacoxae covered with yellowish-white pubescence forming bright maculae.

Body elongate, subcylindrical, feebly narrowed posteriorly. Head slightly wider than pronotal base, occiput with several umbilicate punctures anteriorly; eyes emarginate, coarsely faceted; lower eye lobe 1.5 times as long as width, 2.2 times as long as gena. Antenna long and slender, about 2.7 times body length, finely punctate, basal 3 antennomeres sparsely fringed beneath with short setae; scape gradually thickened apically, with numerous granules near outer edge (Fig. 11); 3rd antennomere 2.8 times as long as scape, 1.2 times as long as 4th, 1.5 times as long as 5th; relative length of antennomeres as follows: 3.5 : 0.7 : 10 : 8.5 : 6.9 : 6.5 : 6.0 : 5.9 : 6.7 : 6.7 : 11.6.

Pronotum broader than long, 0.7 times as long as basal width, width across lateral spines about 1.5 times of basal width; lateral spine stout, strongly thickened at base with acute apex; disk weakly convex, provided with several setigerous granules at sides after middle. Scutellum broadly rounded posteriorly. Prosternal process widened apically; procoxal cavities widely open posteriorly. Mesosternal process without tubercle and obliquely sloped in lateral view.

Elytra elongate, *ca.* 2.1 times as long as humeral width, slightly convergent toward conjointly rounded apices with short sutural teeth; sparsely provided with a few small granules near humeri; disk smooth, impunctate. Legs moderately long, stout; fore femora with coarse wrinkling sculpturing on both sides; metafemora reaching apical fourth of elytra; tarsus five segmented, tarsal claws divaricate.

Male genitalia. Tergite VIII, tegmen and median lobe as in Fig. 17. Endophallus in everted condition (Fig. 20) robust, about 2.3 times as long as median lobe, curved near apical third dorsally; APH defined, limit between BPH and MPH indicated by basal-lateral tubercle (blt); crescent-shaped sclerite absent; MPH subdivided into MT+CT and PB by constrictions, MT slightly longer than CT or PB; CT with lateral tubercles (ltc, Fig. 20d) developed, elongate, directed forward, PB strongly swollen laterally near base, thence, in ventral view, gradually narrowed (Fig. 20d) or expanded in lateral view (Fig. 20) toward apex; APH not subdivided, moderately swollen, weakly sclerotized dorsally from base to gonopore; apical furrow (af) with internal membrane (im) incomplete, represented by short dorsal appendix; spicules mainly distributed on ventral apical surface of MT and apical half of PB; ejaculatory ducts (ej) paired, gonopore (gn) situated near apex of dorsal side of APH.



FIGURES 1–7. Habitus of three species. 1–3, *Ithocritus ruber* (Hope, 1839); 4–5, *Ithocritus similis* Bi & Lin, sp. nov.; 6–7, *Falsimalmus niger* Breuning, 1956. 1, 2, 4, 6, 7, male; 3, 5, female. 1–6, dorsal view; 7, lateral view. Not to scale.

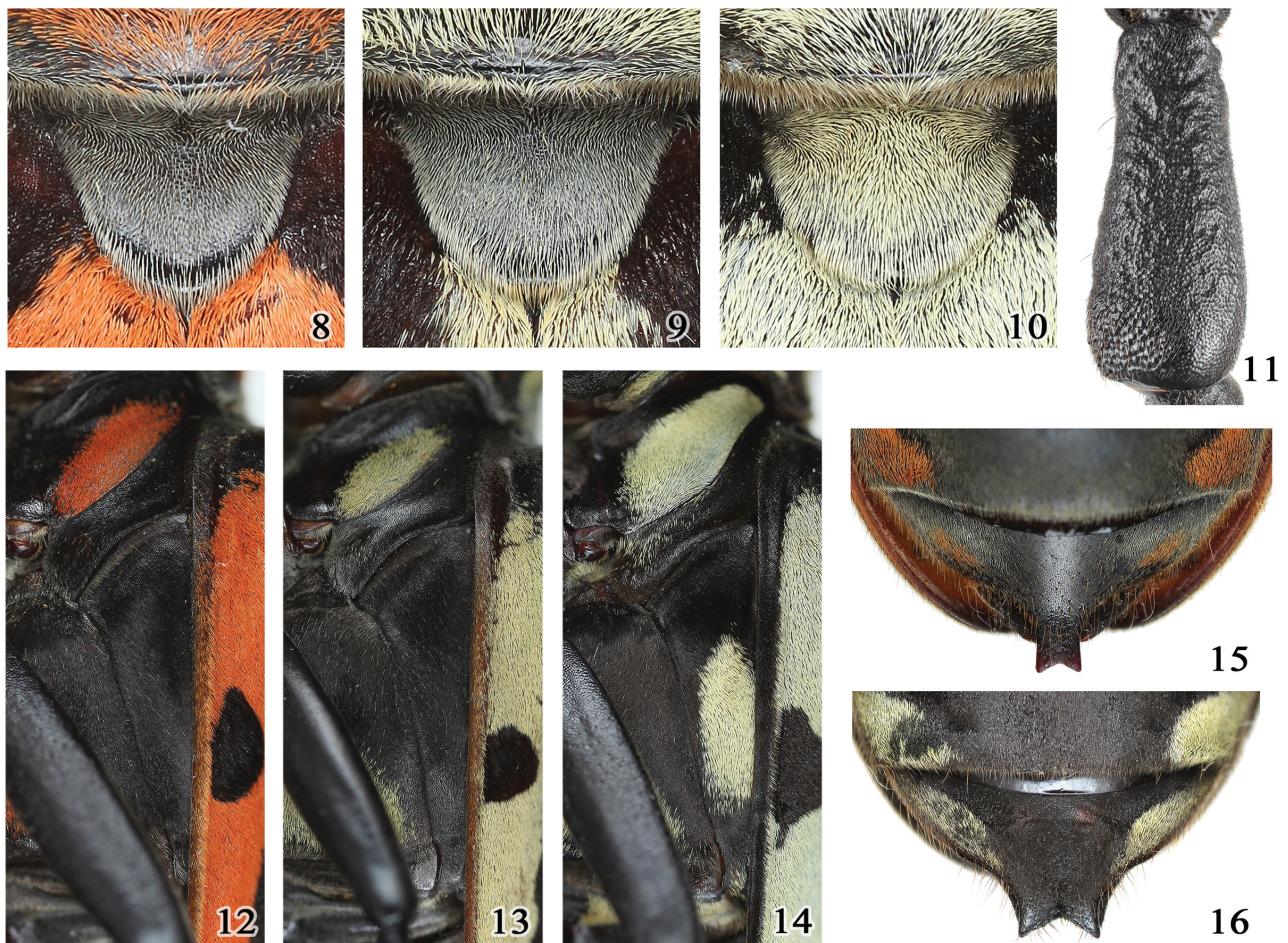
Female (Fig. 5). Body length 35.0–35.5 mm, humeral width 11.1–11.4 mm. Almost identical to male in general appearance. Antenna about 2.0 times body. Head relatively larger, about 1.2 times wider than pronotal base. Abdo-

men with ventrite V (Fig. 16) widely protruded, apex 0.24 times basal width. Legs relatively slenderer and shorter, fore femora without wrinkling sculpturing.

Etymology. From the Latin, meaning similar or resembling, referring to the similarities between the new species and *Ithocritus ruber*.

Distribution. China: Yunnan (Gongshan County).

Remarks. *Ithocritus ruber* also occurs in the type locality of the new species. Both species share highly morphological similarities, especially regarding the yellowish-white colored individuals (Figs. 3–5), but the new species can be distinguished by the metanepisternum and metacoxae provided with bright colored maculae (instead of absent); scutellum densely pubescent, obscuring integument (instead of with pubescence relatively sparser, not obscuring integument); elytra dark-brown (instead of reddish ochraceous); female with abdominal ventrite V widely protruded, apex 0.24 times as basal width (instead of 0.13 times); male with endophallus relatively more robust, CT with lateral tubercles developed, elongate, directed forward (instead of weakly developed), PB strongly swollen laterally near base, thence, in ventral view, gradually narrowed toward apex (instead of weakly swollen laterally and ventrally near base, thence strongly constricted toward subparallel-sided apex).

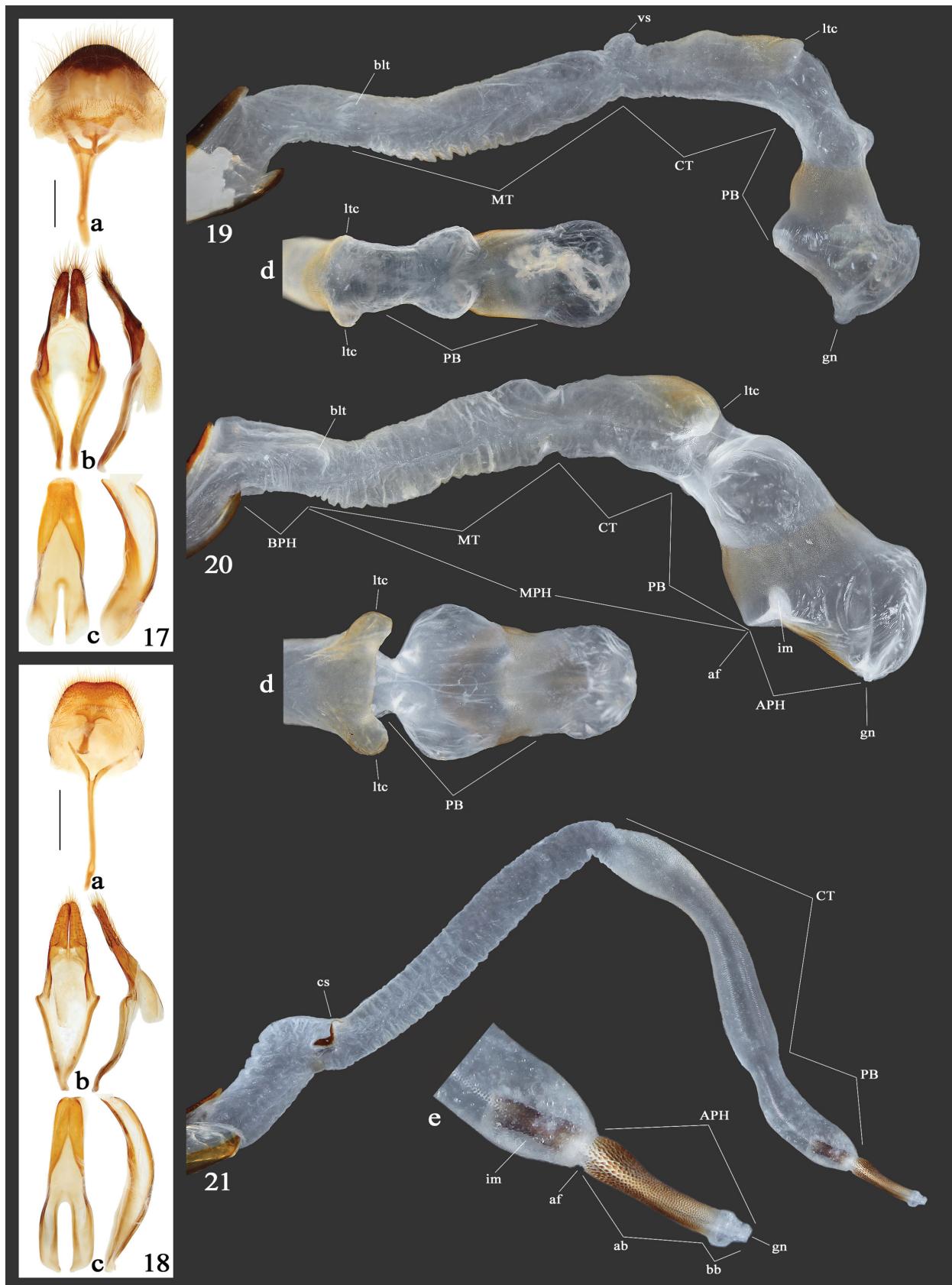


FIGURES 8–16. Habitus of two *Ithocritus* species. 8, 9, 12, 13, 15, *Ithocritus ruber* (Hope, 1839); 10, 11, 14, 16, *Ithocritus similis* Bi & Lin, sp. nov. 8, 9, 10, scutellum; 11, scape (lateral view); 12, 13, 14, meso- and metathorax (lateroventral view), showing the bright pubescent maculae on mesanepisternum or metanepisternum; 15, 16, female abdominal ventrite V. Not to scale.

Genus *Falsimalmus* Breuning, 1956

(Figs. 6, 7, 18, 21)

Falsimalmus Breuning, 1956: 358. Type species: *Falsimalmus niger* Breuning, 1956, by original designation. *Falsimalmus*; Rondon & Breuning, 1970: 486; Ohbayashi & Lin, 2012: 249.



FIGURES 17–21. Male terminalia of three species. 17, 20, *Ithocritus similis* Bi & Lin, sp. nov.; 18, 21 *Falsimalmus niger* Breuning, 1956; 19, *Ithocritus ruber* (Hope, 1839). 17, 18, genitalia. 19, 20, 21, endophallus in inflated and everted condition (lateral view). a, tergite VIII with sternites VIII and IX in ventral view; b, tegmen in ventral view and lateral view; c, median lobe in ventral view and lateral view; d, apical part of endophallus (ventral view); e, enlarged apical part of endophallus (lateral view). 17, 18, scale = 1 mm; others not to scale.

Remarks. This genus consists of a single species and has been placed in the Petrognathini since Breuning (1956) described it. Ohbayashi & Lin (2012) mentioned that the “head with frons is not fully vertical, but more or less inclined anteriad.” According to our observation, the head of this genus is normally vertical (Fig. 7). In addition, the endophallic structure of the only species of this genus has been investigated for the first time and described herein. As shown in the following section, the endophallus of this genus has normally developed crescent-shaped sclerites (absent in *Petrognatha gigas* (Fabricius, 1793) and *Ithocritus* spp.); a developed, complete, elongate and sclerotized internal membrane (im) of apical furrow (incomplete and represented by a short dorsal appendix in *Ithocritus* spp.); a strongly constricted and elongate APH, which is associated with larger spicules (APH swollen and lacking spicules in *Ithocritus* spp.). These features are obviously different from the other members of this tribe studied by the first author, but partially (especially the constricted and spiculate APH with reduced apical bubble and the developed internal membrane of apical furrow) resemble some Lamiini genera, e.g. *Echinovelleda* Breuning, 1936 (Bi 2018: figs. 25, 26), indicating an uncertain tribal position of this genus, which is consistent with the suggestion presented by Ohbayashi & Lin (2012). A further examination based on molecular methods may confirm its systematic position.

***Falsimalmus niger* Breuning, 1956**

(Figs. 6, 7, 18, 21)

Falsimalmus niger Breuning, 1956: 359, fig. 3.

Falsimalmus niger; Rondon & Breuning, 1970: 486; Ohbayashi & Lin, 2012: 250, figs. 26-29; Lin & Yang, 2014: 312.

Material examined. 1 male, China, Yunnan, Yingjiang, Nabang, 473m, 2016.V.30, leg. Xiao-Dong Yang (CCCC).

Complementary description. Male (Figs. 6, 7). Body length 24.0 mm, humeral width 8.2 mm. **Male genitalia.** Tergite VIII, tegmen and median lobe as in Fig. 18. Endophallus in everted condition (Fig. 21) moderately long and slender, about 2.7 times as long as median lobe, curved dorsally near middle; BPH, MPH and APH well-defined; crescent-shaped sclerites (cs) present; MPH subdivided into MT, CT and PB by constrictions; MT slightly shorter than CT and PB combined; MT normally cylindrical, CT swollen near base and apex respectively, PB with anterior bulb generally rudimentary; APH strongly constricted, elongate, broader near base, with apical bulb (ab) 3.8 times longer than apical bubble (bb) (Fig. 21e); apical furrow (af) with internal membrane (im) developed, elongate and sclerotized; spicules distributed on basal half of CT, apical half of PB and with distinctly larger spicules on apical bulb of APH throughout; ejaculatory ducts paired, gonopore (gn) situated at apex of APH.

Distribution. China (new country record): Yunnan (Yingjiang County); Laos (Vientiane); Myanmar (Dawns, Tenasserim); Thailand (Chiang Mai).

Acknowledgments

We wish to express our thanks to James Hogan (OUMNH) for offering type photographs of *Ithocritus ruber* (Hope, 1839), to Adam Śliwiński (CSIRO Australian National Insect Collection, Australia) for confirming the *Batocera* information from Australia and improving the manuscript. The first author thanks Xiao-Dong Yang (Sichuan, China) and Chao Wu (Beijing, China) for collecting specimens and providing great companionship during the expedition to Xizang and / or Yunnan. Thanks are also due to the Zootaxa Cerambycidae editor (Eugenio Nearns, USDA APHIS, Smithsonian Institution, Washington DC, USA) for critical comments. This work was supported by NSFC programs 31472029 (Mei-Ying Lin) and J1210002, and partly by a grant (No. Y229YX5105) from the Key Laboratory of the Zoological Systematics and Evolution of the Chinese Academy of Sciences.

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